



0000100823

ORIGINAL

RECEIVED

BEFORE THE ARIZONA CORPORATION COMMISSION

2002 MAY 29 A 11:47

WILLIAM A. MUNDELL

Chairman

JIM IRVIN

Commissioner

MARC SPITZER

Commissioner

AZ CORP COMMISSION
DOCUMENT CONTROL

IN THE MATTER OF THE GENERIC
PROCEEDINGS CONCERNING
ELECTRIC RESTRUCTURING

DOCKET NO. E-00000A-02-0051

IN THE MATTER OF ARIZONA PUBLIC
SERVICE COMPANY'S REQUEST FOR
VARIANCE OF CERTAIN
REQUIREMENTS OF A.A.C. 4-14-2-1606

DOCKET NO. E-01345A-01-0822

IN THE MATTER OF THE GENERIC
PROCEEDINGS CONCERNING THE
ARIZONA INDEPENDENT
SCHEDULING ADMINISTRATOR

DOCKET NO. E-00000A-01-0630

IN THE MATTER OF TUCSON
ELECTRIC COMPANY'S APPLICATION
FOR A VARIANCE OF CERTAIN
ELECTRIC POWER COMPETITION
RULES COMPLIANCE DATES

DOCKET NO. E-01933A-98-0471

ISSUES IN THE MATTER OF TUCSON
ELECTRIC POWER COMPANY'S
APPLICATION FOR A VARIANCE OF
CERTAIN ELECTRIC COMPETITION
RULES COMPLIANCE DATES

DOCKET NO. E-01933A-02-0069

NOTICE OF FILING DIRECT
TESTIMONY

Intervenor Panda Gila River, L.P. hereby provides notice of filing the Direct Testimony
of Craig R. Roach, Ph.D. concerning the "Track A" issues in the above-captioned dockets.

Arizona Corporation Commission

DOCKETED

MAY 29 2002

DOCKETED BY

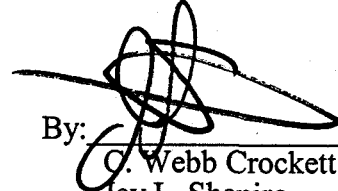
mar

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26

RESPECTFULLY SUBMITTED this 29th day of May, 2002.

FENNEMORE CRAIG

By:



C. Webb Crockett
Jay L. Shapiro
Fennemore Craig
3003 N. Central Ave., Suite 2600
Phoenix, AZ 85012
Attorneys for Panda Gila River, L.P.

Larry F. Eisenstat
Frederick D. Ochsenhirt
Dickstein Shapiro Morin & Oshinsky, LLP
2101 L Street, NW
Washington, DC 20037
Attorneys for TPS GP, Inc., a general partner
of Panda Gila River, L.P.

See attached for filing and service list.

1286016.1/73262.005

ORIGINAL, +10 copies of the foregoing filed this
day of May, 2002, with:

Docket Control
ARIZONA CORPORATION COMMISSION
1200 West Washington
Phoenix, Arizona

COPY hand delivered this day to:

CHAIRMAN WILLIAM MUNDELL
Arizona Corporation Commission
1200 W. Washington St.
Phoenix, AZ 85007

COMMISSIONER JIM IRVIN
Arizona Corporation Commission
1200 W. Washington St.
Phoenix, AZ 85007

COMMISSIONER MARC SPITZER
Arizona Corporation Commission
1200 W. Washington St.
Phoenix, AZ 85007

HERCULES DELLAS, AIDE TO CHAIRMAN
MUNDELL
Arizona Corporation Commission
1200 W. Washington St.
Phoenix, AZ 85007

KEVIN BARLAY, AIDE TO
COMMISSIONER IRVIN
Arizona Corporation Commission
1200 W. Washington St.
Phoenix, AZ 85007

PAUL WALKER, AIDE TO COMMISSIONER
SPITZER
Arizona Corporation Commission
1200 W. Washington St.
Phoenix, AZ 85007

Lyn Farmer
Chief Administrative Law Judge
ARIZONA CORPORATION COMMISSION
1200 W. Washington Street
Phoenix, Arizona 85007

Christopher Kempsey, Chief Counsel
ARIZONA CORPORATION COMMISSION

1200 W. Washington Street
Phoenix, Arizona 85007

Ernest G. Johnson, Utilities Division
ARIZONA CORPORATION COMMISSION
1200 West Washington Street
Phoenix, Arizona 85007

COPY MAILED/E-MAILED* this 27th day
of May, 2002, to:

Lindy Funkhouser
Scott S. Wakefield
RUCO
2828 N Central Ave, Suite 1200
Phoenix, Arizona 85004

*Michael A. Curtis
*William P. Sullivan
*Paul R. Michaud
MARTINEZ & CURTIS, P.C.
2712 North 7th Street
Phoenix, Arizona 85006
Attorneys for Arizona Municipal Power Users
Association, Mohave Electric Cooperative, Inc.,
Navopache Electric Cooperative, Inc., & Primesouth,
Inc.
mcurtis401@aol.com
wsullivan@martinezcurtis.com
pmichaud@martinezcurtis.com

Walter W. Meek, President
ARIZONA UTILITY INVESTORS ASSOCIATION
2100 N. Central Avenue, Suite 210
Phoenix, Arizona 85004

Rick Gilliam
Eric C. Guidry
LAND AND WATER FUND OF THE ROCKIES
ENERGY PROJECT
2260 Baseline Road, Suite 200
Boulder, Colorado 80302

Terry Frothun
ARIZONA STATE AFL-CIO
5818 N. 7th Street, Suite 200
Phoenix, Arizona 85014-5811

Norman J. Furuta
DEPARTMENT OF THE NAVY
900 Commodore Drive, Building 107
San Bruno, California 94066-5006

Barbara S. Bush
COALITION FOR RESPONSIBLE ENERGY
EDUCATION
315 West Riviera Drive
Tempe, Arizona 85252

Sam Defraw (Attn. Code 00I)
Rate Intervention Division
NAVAL FACILITIES ENGINEERING COMMAND
Building 212, 4th Floor
901 M Street, SE
Washington, DC 20374-5018

Rick Lavis
ARIZONA COTTON GROWERS ASSOCIATION
4139 East Broadway Road
Phoenix, Arizona 85040

Steve Brittle
DON'T WASTE ARIZONA, INC.
6205 South 12th Street
Phoenix, Arizona 85040

COLUMBUS ELECTRIC COOPERATIVE, INC.
P.O. Box 631
Deming, New Mexico 88031

CONTINENTAL DIVIDE ELECTRIC
COOPERATIVE
P.O. Box 1087
Grants, New Mexico 87020

DIXIE ESCALANTE RURAL ELECTRIC
ASSOCIATION
CR Box 95
Beryl, Utah 84714

GARKANE POWER ASSOCIATION, INC.
P.O. Box 790
Richfield, Utah 84701

ARIZONA DEPT OF COMMERCE
ENERGY OFFICE
3800 North Central Avenue, 12th Floor
Phoenix, Arizona 85012

ARIZONA COMMUNITY ACTION ASSOC.
2627 N. 3rd Street, Suite 2
Phoenix, Arizona 85004

TUCSON ELECTRIC POWER CO.
Legal Dept - DB203
220 W 6th Street
1285855.3/73262.005

P.O. Box 711
Tucson, Arizona 85702-0711

A.B. Baardson
NORDIC POWER
6463 N. Desert Breeze Ct.
Tucson, Arizona 85750-0846

Jessica Youle
PAB300
SALT RIVER PROJECT
P.O. Box 52025
Phoenix, Arizona 85072-2025

Joe Eichelberger
MAGMA COPPER COMPANY
P.O. Box 37
Superior, Arizona 85273

Craig Marks
CITIZENS UTILITIES COMPANY
2901 N. Central Avenue, Suite 1660
Phoenix, Arizona 85012-2736

Barry Huddleston
DESTEC ENERGY
P.O. Box 4411
Houston, Texas 77210-4411

Steve Montgomery
JOHNSON CONTROLS
2032 West 4th Street
Tempe, Arizona 85281

Peter Glaser
Shook, Hardy & Bacon, L.L.P.
600 14th Street, N.W., Suite 800
Washington, D.C. 20006-2004

Clara Peterson
AARP
HC 31, Box 977
Happy Jack, Arizona 86024

Larry McGraw
USDA-RUS
6266 Weeping Willow
Rio Rancho, New Mexico 87124

Jim Driscoll
ARIZONA CITIZEN ACTION
5160 E. Bellevue Street, Apt. 101
Tucson, AZ 85712-4828

William Baker
ELECTRICAL DISTRICT NO. 6
7310 N. 16th Street, Suite 320
Phoenix, Arizona 85020

Robert Julian
PPG
1500 Merrell Lane
Belgrade, Montana 59714

Robert S. Lynch
340 E. Palm Lane, Suite 140
Phoenix, Arizona 85004-4529
Attorney for Arizona Transmission Dependent
Utility Group

K.R. Saline
K.R. SALINE & ASSOCIATES
Consulting Engineers
160 N. Pasadena, Suite 101
Mesa, Arizona 85201-6764

Carl Robert Aron
Executive Vice President and COO
ITRON, INC.
2818 N. Sullivan Road
Spokane, Washington 99216

Douglas Nelson
DOUGLAS C. NELSON PC
7000 N. 16th Street, Suite 120-307
Phoenix, Arizona 85020-5547
Attorney for Calpine Power Services

*Lawrence V. Robertson Jr.
MUNGER CHADWICK, PLC
333 North Wilmot, Suite 300
Tucson, Arizona 85711-2634
Attorney for Southwestern Power Group, II, LLC;
Bowie Power Station, LLC; Toltec Power Station,
LLC; and Semptra Energy Resources
Lvrobertson@mungerchadwick.com

*Tom Wran
Southwestern Power Group II
Twray@southwesternpower.com

*Theodore E. Roberts
SEMPRA ENERGY RESOURCES
101 Ash Street, HQ 12-B
San Diego, California 92101-3017

Troberts@semptra.com

Albert Sterman
ARIZONA CONSUMERS COUNCIL
2849 East 8th Street
Tucson, Arizona 85716

*Michael Grant
GALLAGHER & KENNEDY
2575 East Camelback Road
Phoenix, Arizona 85016-9225
Attorneys for AEPCO, Graham County Electric
Cooperative, and Duncan Valley Electric
Cooperative.
Mmg@gknet.com

Vinnie Hunt
CITY OF TUCSON
Department of Operations
4004 S. Park Avenue, Building #2
Tucson, Arizona 85714

Ryle J. Carl III
INTERNATION BROTHERHOOD OF
ELECTRICAL WORKERS, L.U. #1116
750 S. Tucson Blvd.
Tucson, Arizona 85716-5698

Carl Dabelstein
CITIZENS COMMUNICATIONS
2901 N. Central Ave., Suite 1660
Phoenix, Arizona 85012

Roderick G. McDougall, City Attorney
CITY OF PHOENIX
Attn: Jesse Sears, Assistant Chief Counsel
200 W Washington Street, Suite 1300
Phoenix, Arizona 85003-1611

*William J. Murphy
CITY OF PHOENIX
200 West Washington Street, Suite 1400
Phoenix, Arizona 85003-1611
Bill.murphy@phoenix.gov

*Russell E. Jones
WATERFALL ECONOMIDIS CALDWELL
HANSHAW & VILLAMANA, P.C.
5210 E. Williams Circle, Suite 800
Tucson, Arizona 85711
Attorneys for Trico Electric Cooperative, Inc.
Rjones@wechv.com

*Christopher Hitchcock
HITCHCOCK & HICKS
P.O. Box 87
Bisbee, Arizona 85603-0087
Attorney for Sulphur Springs Valley
Electric Cooperative, Inc.
Lawyers@bisbeelaw.com

Andrew Bettwy
Debra Jacobson
SOUTHWEST GAS CORPORATION
5241 Spring Mountain Road
Las Vegas, Nevada 89150-0001

Barbara R. Goldberg
OFFICE OF THE CITY ATTORNEY
3939 Civic Center Blvd.
Scottsdale, Arizona 85251

Bradford A. Borman
PACIFICORP
201 S. Main, Suite 2000
Salt Lake City, Utah 84140

Timothy M. Hogan
ARIZONA CENTER FOR LAW
IN THE PUBLIC INTEREST
202 E. McDowell Rd., Suite 153
Phoenix, Arizona 85004

Marcia Weeks
18970 N. 116th Lane
Surprise, Arizona 85374

John T. Travers
William H. Nau
272 Market Square, Suite 2724
Lake Forest, Illinois 60045

Timothy Michael Toy
WINTHROP, STIMSON, PUTNAM & ROBERTS
One Battery Park Plaza
New York, New York 10004-1490

*Raymond S. Heyman
Michael W. Patten
ROSHKA HEYMAN & DEWULF, PLC
400 E. Van Buren, Suite 800
Phoenix, Arizona 85004
Attorneys for Tucson Electric Power Co.
Rheyman@rhd-law.com

Billie Dean
1285855.3/73262.005

AVIDD
P O Box 97
Marana, Arizona 85652-0987
Raymond B. Wuslich
WINSTON & STRAWN
1400 L Street, NW
Washington, DC 20005

Steven C. Gross
PORTER SIMON
40200 Truckee Airport Road
Truckee, California 96161-3307
Attorneys for M-S-R Public Power Agency

Donald R. Allen
John P. Coyle
DUNCAN & ALLEN
1575 Eye Street, N.W., Suite 300
Washington, DC 20005

Ward Camp
PHASER ADVANCED METERING SERVICES
400 Gold SW, Suite 1200
Albuquerque, New Mexico 87102

Theresa Drake
IDAHO POWER COMPANY
P.O. Box 70
Boise, Idaho 83707

Libby Brydolf
CALIFORNIA ENERGY MARKETS
NEWSLETTER
2419 Bancroft Street
San Diego, California 92104

Paul W. Taylor
R W BECK
2201 E. Camelback Rd Suite 115-B
Phoenix, Arizona 85016-3433

James P. Barlett
5333 N. 7th Street, Suite B-215
Phoenix, Arizona 85014
Attorney for Arizona Power Authority

*Jay I. Moyes
MOYES STOREY
3003 N. Central Ave., Suite 1250
Phoenix, Arizona 85012
Attorneys for PPL Southwest Generation Holdings,
LLC; PPL EnergyPlus, LLC and PPL Sundance
Energy, LLC

Jimoyes@lawms.com

Stephen L. Teichler
Stephanie A. Conaghan
DUANE MORRIS & HECKSCHER, LLP
1667 K Street NW, Suite 700
Washington, DC 20006

Kathy T. Puckett
SHELL OIL COMPANY
200 N. Dairy Ashford
Houston, Texas 77079

Andrew N. Chau
SHELL ENERGY SERVICES CO., LLC
1221 Lamar, Suite 1000
Houston, Texas 77010

Peter Q. Nyce, Jr.
DEPARTMENT OF THE ARMY
JALS-RS Suite 713
901 N. Stuart Street
Arlington, Virginia 22203-1837

Michelle Ahlmer
ARIZONA RETAILERS ASSOCIATION
224 W. 2nd Street
Mesa, Arizona 85201-6504

Dan Neidlinger
NEIDLINGER & ASSOCIATES
3020 N. 17th Drive
Phoenix, Arizona 85015

Chuck Garcia
PNM, Law Department
Alvarado Square, MS 0806
Albuquerque, New Mexico 87158

Sanford J. Asman
570 Vinington Court
Dunwoody, Georgia 30350-5710

*Patricia Cooper
AEP/CO/SSWEP/CO
P.O. Box 670
Benson, Arizona 85602
Pcooper@aepnet.org

Steve Segal
LEBOEUF, LAMB, GREENE, & MACRAE
633 17th Street, Suite 2000
Denver, Colorado 80202-3620

Holly E. Chastain
SCHLUMBERGER RESOURCE
MANAGEMENT SERVICES, INC.
5430 Metric Place
Norcross, Georgia 30092-2550

Leslie Lawner
ENRON CORP
712 North Lea
Roswell, New Mexico 88201

Alan Watts
Southern California Public Power Agency
529 Hilda Court
Anaheim, California 92806

Frederick M. Bloom
Commonwealth Energy Corporation
15991 Red Hill Avenue, Suite 201
Tustin, California 92780

Margaret McConnell
Maricopa Community Colleges
2411 W. 14th Street
Tempe, Arizona 85281-6942

Brian Soth
FIRSTPOINT SERVICES, INC.
1001 S.W. 5th Ave, Suite 500
Portland, Oregon 97204

Jay Kaprosy
PHOENIX CHAMBER OF COMMERCE
201 N. Central Ave., 27th Floor
Phoenix, Arizona 85073

Kevin McSpadden
MILBANK, TWEED, HADLEY AND
MCCLOY, LLP
601 S. Figueroa, 30th Floor
Los Angeles, California 90017

M.C. Arendes, Jr.
C3 COMMUNICATIONS, INC.
2600 Via Fortuna, Suite 500
Austin, Texas 78746

*Patrick J. Sanderson
ARIZONA INDEPENDENT SCHEDULING
ADMINISTRATOR ASSOCIATION
P.O. Box 6277
Phoenix, Arizona 85005-6277

Psanderson@az-isa.org

*Roger K. Ferland
QUARLES & BRADY STREICH LANG, L.L.P.
Renaissance One
Two North Central Avenue
Phoenix, Arizona 85004-2391
Rferland@quarles.com

Charles T. Stevens
ARIZONANS FOR ELECTRIC CHOICE &
COMPETITION
245 W. Roosevelt
Phoenix, Arizona 85003

Mark Sirois
ARIZONA COMMUNITY ACTION ASSOC.
2627 N. Third Street, Suite 2
Phoenix, Arizona 85004

*Jeffrey Guldner
Thomas L. Mumaw
SNELL & WILMER
400 E. Van Buren,
One Arizona Center
Phoenix, Arizona 85004-0001
Tmumaw@swlaw.com

Steven J. Duffy
RIDGE & ISAACSON PC
3101 N. Central Avenue, Suite 740
Phoenix, Arizona 85012

*Greg Patterson
5432 E. Avalon
Phoenix, Arizona 85018
Gpatterson@aol.com

*John Wallace
Grand Canyon State Electric Co-op
120 N. 44th Street, Suite 100
Phoenix, Arizona 85034-1822
Jwallace@gcseca.org

Steven Lavigne
DUKE ENERGY
4 Triad Center, Suite 1000
Salt Lake City, Utah 84180

Dennis L. Delaney
K.R. SALINE & ASSOC.
160 N. Pasadena, Suite 101
Mesa, Arizona 85201-6764
1285855.3/73262.005

Kevin C. Higgins
ENERGY STRATEGIES, LLC
30 Market Street, Suite 200
Salt Lake City, Utah 84101

*Michael L. Kurtz
BORHM KURTZ & LOWRY
36 E. Seventh Street, Suite 2110
Cincinnati, Ohio 45202
Mkurtzlaw@aol.com

David Berry
P.O. Box 1064
Scottsdale, Arizona 85252

*William P. Inman
Dept. of Revenue
1600 W. Monroe, Room 911
Phoenix, Arizona 85007
InmanW@revenue.state.az.us

*Robert Baltes
ARIZONA COGENERATION ASSOC.
7250 N. 16th Street, Suite 102
Phoenix, Arizona 85020-5270
Rbaltes@bvaeng.com

*Jana Van Ness
APS
Mail Station 9905
P.O. Box 53999
Phoenix, Arizona 85072-3999
Jana.vanness@aps.com

David Couture
TEP
4350 E. Irvington Road
Tucson, Arizona 85714

*Kelly Barr
Jana Brandt
SRP
Mail Station PAB211
P.O. Box 52025
Phoenix, Arizona 85072-2025
Kjbarr@srpnet.com
Jkbrandt@srpnet.com

Randall H. Warner
JONES SKELTON & HOCHULI PLC
2901 N. Central Avenue, Suite 800
Phoenix, Arizona 85012

John A. LaSota, Jr.
MILLER LASOTA & PETERS, PLC
5225 N. Central Ave., Suite 235
Phoenix, Arizona 85012

Peter W. Frost
Conoco Gas and Power Marketing
600 N. Dairy Ashford, CH-1068
Houston, Texas 77079

Joan Walker-Ratliff
Conoco Gas and Power Marketing
1000 S. Pine, 125-4 ST UPO
Ponca City, Oklahoma 74602

*Vicki G. Sandler
C/o Linda Spell
APS Energy Services
P.O. Box 53901
Mail Station 8103
Phoenix, Arizona 85072-3901
Linda_spell@apses.com

*Lori Glover
STIRLING ENERGY SYSTEMS
2920 E. Camelback Rd., Suite 150
Phoenix, Arizona 85016
Lglover@stirlingenergy.com

*Jeff Schlegel
SWEEP
1167 Samalayuca Drive
Tucson, Arizona 85704-3224
Schlegelj@aol.com

*Howard Geller
SWEEP
2260 Baseline Rd., Suite 200
Boulder, Colorado 80302
Hgeller@swenergy.org

*Mary-Ellen Kane
ACAA
2627 N. 3rd Street, Suite Two
Phoenix, Arizona 85004
Mkane@azcaa.org

*Aaron Thomas
AES NewEnergy
350 S. Grand Avenue, Suite 2950
Los Angeles, California 90071

1285855.3/73262.005

Aaron.thomas@aes.com

*Theresa Mead
AES NewEnergy
P.O. Box 65447
Tucson, Arizona 85728
Theresa.mead@aes.com

*Peter Van Haren
CITY OF PHOENIX
Attn: Jesse W. Sears
200 W. Washington Street, Suite 1300
Phoenix, Arizona 85003-1611
Jesse.sears@phoenix.gov

*Robert Annan
ARIZONA CLEAN ENERGY INDUSTRIES
ALLIANCE
6605 E. Evening Glow Drive
Scottsdale, Arizona 85262
Annan@primenet.com

Curtis L. Kebler
RELIANT RESOURCES, INC.
8996 Etiwanda Avenue
Rancho Cucamonga, California 91739

*Philip Key
RENEWABLE ENERGY LEADERSHIP GROUP
10631 E. Autumn Sage Drive
Scottsdale, Arizona 85259
Keytaic@aol.com

*Paul Bullis
OFFICE OF THE ATTORNEY GENERAL
1275 W. Washington Street
Phoenix, Arizona 85007
Paul.bullis@ag.state.az.us

*Laurie Woodall
OFFICE OF THE ATTORNEY GENERAL
15 S. 15th Avenue
Phoenix, Arizona 85007
Laurie.woodall@ag.state.az.us

*Donna M. Bronski
CITY OF SCOTTSDALE
3939 N. Drinkwater Blvd
Scottsdale, Arizona 85251
Dbronski@ci.scottsdale.az.us

*Larry F. Eisenstat
Frederick D. Ochsenhirt

DICKSTEIN SHAPIRO MORIN & OSHINSKY
LLP

2101 L Street, NW
Washington, DC 20037

Eisenstatl@dsmo.com

Ochsenhirtff@dsmo.com

*David A. Crabtree

Dierdre A. Brown

TECO POWER SERVICES CORP.

P.O. Box 111

Tampa, Florida 33602

Dacrabtree@tecoenergy.com

Dabrown@tecoenergy.com

*Michael A. Trentel

Patrick W. Burnett

PANDA ENERGY INTERNATIONAL INC

4100 Spring Valley, Suite 1010

Dallas, Texas 75244

Michaelt@pandaenergy.com

Patb@pandaenergy.com

ARIZONA REPORTING SERVICE, INC.

2627 N. Third Street, Suite Three

Phoenix, Arizona 85004-1104

BEFORE THE ARIZONA CORPORATION COMMISSION

WILLIAM A. MUNDELL

Chairman

JIM IRVIN

Commissioner

MARC SPITZER

Commissioner

IN THE MATTER OF THE GENERIC
PROCEEDINGS CONCERNING ELECTRIC
RESTRUCTURING

DOCKET NO. E-00000A-02-0051

IN THE MATTER OF ARIZONA PUBLIC
SERVICE COMPANY'S REQUEST FOR
VARIANCE OF CERTAIN
REQUIREMENTS OF A.A.C. 4-14-2-1606

DOCKET NO. E-01345A-01-0822

IN THE MATTER OF THE GENERIC
PROCEEDINGS CONCERNING THE
ARIZONA INDEPENDENT SCHEDULING
ADMINISTRATOR

DOCKET NO. E-00000A-01-0630

IN THE MATTER OF TUCSON ELECTRIC
COMPANY'S APPLICATION FOR A
VARIANCE OF CERTAIN ELECTRIC
POWER COMPETITION RULES
COMPLIANCE DATES

DOCKET NO. E-01933A-98-0471

ISSUES IN THE MATTER OF TUCSON
ELECTRIC POWER COMPANY'S
APPLICATION FOR A VARIANCE OF
CERTAIN ELECTRIC COMPETITION
RULES COMPLIANCE DATES

DOCKET NO. E-01933A-02-0069

DIRECT TESTIMONY OF
CRAIG R. ROACH, Ph.D.
ON "TRACK A" ISSUES

ON BEHALF OF
PANDA GILA RIVER, L.P.

May 29, 2002

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26

TABLE OF CONTENTS

| | Page |
|---|------|
| I. QUALIFICATIONS | 1 |
| II. PURPOSE OF TESTIMONY | 2 |
| III. SUMMARY OF TESTIMONY | 3 |
| IV. APS HAS MARKET POWER IN ITS SERVICE TERRITORY IN BOTH GENERATION AND TRANSMISSION | 4 |
| V. ADDITIONAL MITIGATION IS REQUIRED TO ADDRESS APS' MARKET POWER IN THE TRANSMISSION CONSTRAINED AREA OF PHOENIX | 13 |
| VI. RECOMMENDATIONS TO THE COMMISSION | 15 |

1 **I. QUALIFICATIONS**

2 **Q. PLEASE STATE YOUR NAME, POSITION, AND BUSINESS ADDRESS.**

3 **A.**My name is Craig R. Roach. I am a Partner with Boston Pacific Company, Inc. My
4 business address is 1100 New York Avenue, NW, Suite 490 East, Washington, DC 20005.

5 **Q. PLEASE SUMMARIZE YOUR EDUCATIONAL BACKGROUND.**

6 **A.**I earned my Ph.D. in Economics from the University of Wisconsin and my Bachelor of
7 Science Degree in Economics, cum laude, from John Carroll University.

8 **Q. PLEASE SUMMARIZE YOUR PROFESSIONAL EXPERIENCE.**

9 **A.**I have twenty-seven years of experience working on investments in, policies for, and
10 litigation concerning the electricity and natural gas businesses. From 1975 to 1979, I was
11 an economist with the U.S. Congressional Budget Office. From 1979 to 1982, I was a
12 Project Manager with ICF Incorporated, an energy and environmental consulting firm.

13 From 1983 to the present, I have worked with Boston Pacific, first in San Francisco
14 and since 1987 in Washington, D.C. Boston Pacific is an energy consulting and
15 investment services firm. My clients include competitive power suppliers, electric
16 utilities, electric and gas marketers, gas pipeline companies, trade associations,
17 government agencies, and energy consumers.

18 **Q. DO YOU HAVE EXPERIENCE AS AN EXPERT WITNESS?**

19 **A.**Yes. I have extensive experience as an expert witness on electricity and natural gas issues.
20 A complete list of my testimony is contained in Exhibit No. CRR-1. Also shown therein is
21 a list of my speeches and articles on issues in the electricity and natural gas businesses,
22 and on other energy businesses.

23 I have submitted testimony, affidavits, or comments to the Federal Energy
24 Regulatory Commission ("FERC") in sixteen proceedings, to public utility commissions in
25 fifteen states (some on multiple occasions), in arbitrations, in State Court, in Federal
26 Court, to a City Council, before two Canadian Provincial Boards, and before a

1 Congressional Subcommittee.

2 Q. DO YOU HAVE EXPERIENCE TESTIFYING ON THE ISSUE OF MARKET POWER?

3 A. Yes. I have served as an expert witness on market power in the electricity and natural gas
4 businesses in a great number of proceedings. Since January 2001 alone, I have been
5 invited to participate in three FERC Technical Conferences on market power monitoring
6 and mitigation.

7 Q. DO YOU HAVE RELEVANT EXPERIENCE BEYOND THAT REFLECTED IN YOUR
8 EXPERT TESTIMONY?

9 A. Yes. Beyond expert testimony, I have extensive experience providing financial advisory
10 services for power project development and asset acquisition throughout the U.S. and
11 around the world.

12 Q. HAVE YOU TESTIFIED BEFORE THE ARIZONA CORPORATION COMMISSION
13 IN RELATED PROCEEDINGS?

14 A. My Direct Testimony was filed with the Arizona Corporation Commission (Commission)
15 in connection with the Arizona Public Service (APS) request for (a) a variance from the
16 Electric Competition Rules and (b) approval of a power purchase agreement (PPA) with an
17 Affiliate (Affiliate PPA).

18 Q. ON WHOSE BEHALF ARE YOU TESTIFYING?

19 A. I am testifying again on behalf of Panda Gila River, L.P. (Panda).

20 **II. PURPOSE OF TESTIMONY**

21 Q. WHAT IS THE PURPOSE OF THIS TESTIMONY?

22 A. The purpose of my Testimony is to address the issues set by the Commission for what is
23 termed "Track A" of this proceeding. The Commission stated:

24 The hearing on the issues identified in Staff's April 23, 2002
25 Response to Arizona Public Service Company's Motion for
26 Determination of Threshold Issue – the transfer of assets and
associated market power issues, as well as the issues of the
Code of Conduct, the Affiliated Interest Rules, and the
jurisdictional issues raised by Chairman Mundell,

(collectively, the "Track A" issues) will be conducted beginning on June 17, 2002. The Competitive Solicitation ("Track B") will proceed concurrently with Track A, with a target completion date of October 21, 2002.¹

Q. HOW DID STAFF PHRASE THE MARKET POWER CONCERN REFERENCED BY THE COMMISSION?

A. Staff's concern is put in terms of transferring assets when there is "inadequate competition." Specifically, Staff states:

In particular, Staff has concerns about the market power impacts of transfer of generating assets from a utility to an affiliate where there is inadequate competition to protect standard offer customers from market power abuse.² [Emphasis added]

At a later point in the same document, Staff reminds us that Standard Offer customers remain "captive customers" after the transfer if there is no competition.

Specifically, Staff states:

As a result, it is Staff's view that the very first issues that must be considered are the Transfer and Separation of Assets, along with consideration of the initial Market Power and Monitoring considerations arising from the removal of all or some generation currently used to supply standard offer customers from this Commission's jurisdiction. An orderly transition to competition necessitates that a competitive market be enabled, yet demands protection for **customers who continue to be captive.**³ [Emphasis added]

My testimony addresses these issues.

III. SUMMARY OF TESTIMONY

Q. PLEASE SUMMARIZE YOUR TESTIMONY.

A. I conclude that: (a) APS has generation and transmission market power; (b) if APS is allowed to unconditionally transfer its generation facilities to an Affiliate, it will also be transferring its market power to that Affiliate; and (c) because the Commission will have

¹ Procedural Order (May 2, 2002) page 1 line 25 to pages 2 line 3.

² Staff's Response to Arizona Public Service Company's Motion for Determination of Threshold Issue in Docket No. E-01345A-01-0822 (April 2002) at page 2, line 22 to 24.

³ Id., page 4 lines 20 to 25.

1 less authority after the transfer to prevent harm to consumers from the exercise of market
2 power by that Affiliate, it must ensure that, prior to such transfer, APS' market power will
3 be mitigated.

4 Accordingly, I recommend that the Commission prohibit the asset transfer until
5 APS has plans in place to competitively procure, or has competitively procured, 100% of
6 its Standard Offer service requirements. In addition, the Commission should (a) require
7 APS to establish short-term energy markets, including a real-time balancing market; (b)
8 require APS to provide an opportunity for all generators selected by competitive
9 procurement or by the short-term markets to be designated Network Resources; and (c)
10 require APS to issue RFP(s) for generation within the constrained Valley region.

11 **IV. APS HAS MARKET POWER IN ITS SERVICE TERRITORY IN BOTH**
12 **GENERATION AND TRANSMISSION. THAT MARKET POWER MUST**
13 **BE MITIGATED PRIOR TO THE TRANSFER OF APS' GENERATORS**
14 **TO ITS UNREGULATED AFFILIATE. SUCH MITIGATION CAN BE**
15 **ACCOMPLISHED IF, AND ONLY IF, COMPETITIVE POWER**
16 **SUPPLIERS ARE PROVIDED A FORUM IN WHICH TO COMPETE.**

17 Q. DO YOU BELIEVE STAFF'S MARKET POWER CONCERNS ARE JUSTIFIED?

18 A. Yes. Staff raises two key, legitimate concerns. First, unless APS' market power is
19 mitigated prior to the transfer, APS' market power will simply be bequeathed to its
20 Affiliate, Pinnacle West Energy Corporation (PWEC). As Staff puts it, current Standard
21 Offer customers would become "captive customers" of PWEC, and then the Commission
22 would have no control because PWEC is not subject to the Commission's jurisdiction.

23 Second, only by ensuring adequate competition before the transfer can the
24 Commission protect these captive customers after the transfer. For this very reason, APS
25 gained the right to transfer its generation assets only if it agreed to comply with the
26 Electric Competition Rules, including that it competitively procure 100% of the power to
fulfill its Standard Offer needs.⁴ Competitive procurement was the quid pro quo for the

⁴ Addendum to Settlement Agreement II 5(3). Rebuttal Testimony of Jack E. Davis in Docket No. E-01345A-01-0822, et al. (April 2002) at pages 13-14.

1 asset transfer. APS should not be allowed to transfer its assets to PWEC until it fulfills its
2 promise to conduct competitive procurement.

3 Q. DO YOU OPPOSE, UNDER ALL CIRCUMSTANCES, APS' DIVESTITURE TO AN
4 AFFILIATE?

5 A. Not at all. I would not oppose the asset transfer contemplated by APS provided APS
6 mitigates its generation market power, rather than bequeathing market power to its
7 unregulated Affiliate, as a precursor to full competition as provided for in the Electric
8 Competition Rules.

9 Q. WOULD THIS CONCERN WITH MARKET POWER PERSIST EVEN IF THE
10 TRANSFER ENTAILED A CONTRACT TO SELL BACK AT COST-PLUS RATES?

11 A. Yes, absolutely. The exercise of market power in this case means that, for a sustained
12 period of time, Standard Offer customers would pay higher prices, face greater risks, and
13 suffer lower reliability with PWEC service than they would if served by competing
14 suppliers. As explained in my Testimony in the variance proceeding, which I incorporate
15 here by reference, I am convinced this would have been the fate of Standard Offer
16 customers had the Affiliate PPA with PWCC been approved. The Affiliate PPA, with a
17 potential 29-year term, underscores precisely why the Commission must be concerned
18 with market power, even with a cost-plus contract between APS and an Affiliate. Even
19 under a cost-plus contract, APS can simply bequeath its market power to an Affiliate
20 and ignore the competitive challenge from several thousand megawatts of new merchant
21 generators.

22 Q. HOW DOES FERC ASSESS GENERATION MARKET POWER?

23 A. At present, FERC does this by means of the Supply Margin Assessment (SMA) test for
24 areas outside FERC-approved, operational Regional Transmission Organizations (RTOs).⁵

25 Q. WHAT IS THE BASIC POINT OF THE SMA?

26

⁵ *AEP Power Marketing Inc.*, 97 FERC ¶ 61,219 (2001).

1 A. The SMA seeks to determine if a supplier is "pivotal" in a market. In this case "pivotal"
2 means that the supplier's capacity is essential to meeting the market's peak load. The
3 theory behind the SMA is that, if the supplier's capacity is essential to meeting the peak
4 load, it has the opportunity to drive prices above the levels that would otherwise prevail in
5 a competitive market.

6 Q. WHAT CALCULATIONS ARE NEEDED TO CONDUCT AN SMA?

7 A. The actual calculations in an SMA are straightforward. First, we determine the supply
8 margin, which equals the total supply into the market less the peak load in that market.
9 Total supply equals all in-area generation plus imports from adjoining (or "first-tier")
10 markets. Imports are the lesser of (a) the total transfer capability (TTC) from the adjoining
11 areas or (b) the generation capacity available to be exported from those adjoining areas.

12 Second, we compare the supply margin to the applicant's capacity in that market.
13 If the applicant's capacity is less than the supply margin, the applicant is not deemed to be
14 "pivotal" and, therefore, passes the SMA. If the applicant's capacity exceeds the supply
15 margin, the applicant is deemed to be "pivotal," fails the SMA test, and it is presumed to
16 have generation market power. Consequently, its ability to conduct market-based
17 transactions within that relevant market would be mitigated.

18 Q. PLEASE PROVIDE A SIMPLE EXAMPLE OF THE SMA CALCULATION.

19 A. Assume a hypothetical market has ten, equal-sized suppliers, each with 100 MW of
20 capacity; therefore the total supply to that market is 1,000 MW. Assume further that peak
21 demand in that market is 800 MW. With this assumption, the "supply margin" is 200 MW
22 (1,000 MW of supply less the 800 MW peak demand). Since all ten suppliers have less
23 than the supply margin, meaning no one supplier is indispensable to meeting that peak, all
24 ten would pass the test.

25 Q. CAN THE SMA BE CONDUCTED FOR APS?

26 A. Yes. However, at the outset let me note that there are always assumptions to be made in

- 1 an SMA or any quantitative measure of market power, so allow me to start with a base
2 case SMA and then do alternative SMA calculations to reveal the importance of a few
3 assumptions about the extent of competition.
- 4 Q. PLEASE DISCUSS ALL THE RESULTS OF THE KEY CALCULATIONS FOR YOUR
5 BASE CASE SMA FOR APS.
- 6 A. Certainly. In this base case, total in-area generation for the APS Market, APS's existing
7 control area, in 2003 is 16,315 MW and has four components:
- 8 (a) existing APS-owned, in-area generation (3,710 MW);
 - 9 (b) new APS Affiliate, in-area generation (1,680 MW from the West Phoenix
10 expansion and Red Hawk);
 - 11 (c) in-area utility generation not owned by APS (4,405 MW mainly from co-
owners of Palo Verde, Four Corners, and Cholla); and
 - 12 (d) new, in-area unaffiliated generation owned by Merchants (6,520 MW).
- 13 Q. WHAT IS THE QUANTITY OF POTENTIAL POWER IMPORTS?
- 14 A. Imports are assumed to equal the TTC of 3,900 MW.
- 15 Q. WHAT IS THE TOTAL SUPPLY INTO THE APS MARKET?
- 16 A. Total supply into the APS Market, therefore, is 20,215 MW (16,315 MW in-area plus
17 3,900 MW of imports).
- 18 Q. WHAT IS THE PROJECTED PEAK LOAD FOR APS?
- 19 A. Projected peak load for 2003 is 5,911 MW.
- 20 Q. WHAT IS THE SUPPLY MARGIN GIVEN THESE CALCULATIONS?
- 21 A. The supply margin is 14,304 MW (20,215 MW of supply less the 5,911 MW peak load).
- 22 Q. IN THE BASE CASE, DOES APS PASS THE SMA?
- 23 A. Yes. The base case supply margin exceeds APS-owned capacity of 5,705 MW (5,390
24 MW in-area plus 315 MW from Navajo), so APS passes the SMA.
- 25 Q. WOULD YOU PLEASE SUMMARIZE YOUR BASE CASE SMA IN A TABLE?
- 26 A. Yes. Table One below summarizes my base case SMA for the APS Market.

Table One

THE BASE CASE SMA FOR THE APS MARKET
(All values in MW)

| | |
|---------------------|--------|
| In-Area Capacity | 16,315 |
| Imports | 3,900 |
| Total Supply | 20,215 |
| Projected Peak load | 5,911 |
| Supply Margin | 14,304 |
| APS Capacity | 5,705 |
| Pass/Fail SMA | Pass |

Source: Exhibit No. CRR-2

Q. DO YOU BELIEVE THE BASE CASE IS AN ACCURATE ASSESSMENT OF APS' GENERATION MARKET POWER?

A. No.

Q. WHY NOT?

A. There are three assumptions within the base case SMA that create an understatement of APS' true generation market power.

Q. WHAT IS THE FIRST ASSUMPTION?

A. The first assumption is that in-area Merchants have the opportunity to compete against APS. This is item (d) mentioned above.

Q. IN WHAT CIRCUMSTANCES CAN MERCHANTS COMPETE AGAINST APS?

A. Merchants can compete against APS if and only if they have the opportunity to compete. If APS can simply push these Merchants aside and declare itself or its Affiliate the sole or primary supplier for its Standard Offer load, as it attempted to do through its proposed Affiliate PPA, then APS has the ability to exercise market power.

Q. WHAT IS THE SECOND ASSUMPTION?

A. The second assumption is that non-APS, in-area utility generators are considered competitors to APS. This is item (c) mentioned above. If this generation is committed to other loads and can not be used to undercut an attempt by APS to raise prices above

1 competitive levels, then this generation should not realistically be included as competing
2 generation in the SMA calculations. Moreover, these competitors also can be blocked by
3 APS exercising market power through an Affiliate PPA, as APS has already proposed.

4 Q. IF THESE TWO CATEGORIES OF IN-AREA COMPETITORS ARE NOT ALLOWED
5 TO COMPETE, HOW DOES THE SMA CHANGE?

6 A. Absent the competition from in-area Merchants and non-APS, utility suppliers, the supply
7 margin falls to 3,379 MW. This is significantly less than APS-owned capacity (5,705
8 MW) and, therefore, APS fails the SMA.

9 Q. WOULD YOU PLEASE SUMMARIZE YOUR SMA CALCULATIONS IN THE
10 ABSENCE OF COMPETITION FROM BOTH IN-AREA MERCHANTS AND NON-
11 APS, UTILITY GENERATION?

12 A. Yes. Table Two below summarizes my SMA calculations when neither of these categories
13 of potential in-area suppliers can compete.

14 **Table Two**

15 **THE SMA WHEN MERCHANTS AND NON-APS IN-AREA UTILITY**
16 **GENERATION CANNOT COMPETE IN THE APS MARKET**
(All values in MW)

| | |
|---------------------|--------------|
| In-Area Capacity | 5,390 |
| Imports | <u>3,900</u> |
| Total Supply | 9,290 |
| Projected Peak load | 5,911 |
| Supply Margin | 3,379 |
| APS Capacity | 5,705 |
| Pass/Fail SMA | Fail |

21 **Source: Exhibit No. CRR-2**

22 Q. WHAT IS THE THIRD ASSUMPTION?

23 A. The third assumption is that the Western U.S. has sufficient generating capacity to export
24 up to 3,900 MW to APS. Recall that the SMA asks that imports be reflected as the lower
25 of (a) the TTC or (b) excess generating capacity available for export from the adjoining
26

1 markets. The base case is very conservative. I used the TTC rather than determining how
2 much generation is actually available to export to Arizona.⁶ But, given the experiences in
3 2000, there is reason to believe this is overly optimistic, and certainly not a basis for
4 concluding that significant levels of imports will in fact be available for disciplining APS
5 market power. This gives added importance to ensuring in-area Merchants are allowed to
6 compete with APS.

7 Q. IS THE SMA THE ONLY TEST FOR GENERATION MARKET POWER?

8 A. No. And, as with any quantitative measure of market power, SMA has shortcomings. I
9 present it here to provide some quantitative results to support a basic principle using the
10 market power test currently employed by FERC.

11 But, let's simplify the evidence: There is no competition without real competitors.
12 There are three types of competitors for APS' and its Affiliates own power plants and each
13 type can be eliminated by either market conditions or APS market power.

- 14 • The first type of competitor is in-area Merchants; it is the largest type with 6,520
15 MW. If APS succeeds in denying these suppliers an opportunity to compete by
16 refusing to conduct competitive procurement, it succeeds in eliminating this type of
17 competition by exercising generation market power.
- 18 • The second type of competitor is chiefly utility co-owners of three plants (Cholla,
19 Palo Verde, and Navajo); this type has 4,405 MW. These co-owners probably have
20 previously committed this capacity to their own load and so market conditions may
21 eliminate these competitors, or they could be eliminated by APS exercising
22 generation market power.
- 23 • The third type of competitor is out-of-area suppliers who must gain access through
24 APS controlled transmission; this type is assumed to have 3,900 MW. If there is
25 little excess capacity in the West, these competitors may be eliminated by market

26 ⁶ The analysis is also conservative for other reasons. I have not considered the impact of reserve requirements on
available generation. Consequently, the SMA analysis is likely to understate APS's market power.

1 conditions. Or, they can be eliminated if APS exercises transmission market
2 power.

3 My point is that, regardless of the analytic method used, all three types of
4 competitors are in a position to be eliminated by APS exercising generation or
5 transmission market power. In this sense, APS market power is clearly a concern.

6 Q. WHAT SORT OF MARKET POWER MITIGATION DO YOU BELIEVE WOULD
7 ADDRESS THIS CONCERN?

8 A. Since APS' (and its Affiliates') market power will continue until such time as there is an
9 opportunity for Merchants to compete, the best mitigation is to create one or more such
10 opportunities. The two opportunities I have in mind are (a) competitive procurement in
11 the form of requests for proposals (RFPs) and bilateral arms-length negotiation for longer-
12 term PPAs and (b) the creation of one or more short-term electricity markets.

13 Q. HAVE APS WITNESSES ADDRESSED THE ISSUE OF MARKET POWER IN
14 PREVIOUS TESTIMONY?

15 A. Yes, but not in any depth. For example, Dr. William Hieronymus addresses market power
16 in his rebuttal testimony in the APS variance proceeding.⁷ At the outset he says APS
17 "easily would pass the new Supply Margin Assessment market power standard adopted by
18 FERC late last year."⁸ As my SMA results show, this is true if and only if Merchants and
19 other in-area, non-APS utility generation are given a fair opportunity to compete, pursuant
20 to Rule 1606(B) or such other processes as is adopted by the Commission in the Track B
21 proceeding.

22 Q. DOES HE MAKE ADDITIONAL COMMENTS?

23 A. Yes. Dr. Hieronymus makes several comments that perpetuate misconceptions about
24 market power in the electricity business. Let me make a few clarifying points.

25
26 ⁷ Rebuttal Testimony of William H. Hieronymus (Docket No. E-01345A-01-0822, et al) page 17 line 17 to page 19 line 17.

⁸ Id. at page 17 line 23 to page 18 line 1.

- 1 • Market power is not just a problem in short-term (“spot”) markets, it can be
2 exercised in long-term markets as well. Indeed, exercising market power in longer-
3 term sales clearly has a larger impact on ratepayers because it can lock in market
4 power for years and, thereby, can raise prices well above competitive levels for a
5 larger volume of electricity sales for a longer period of time.
- 6 • As already noted, a longer-term contract with an affiliate mitigates market power if
7 and only if the price and non-price terms of that contract result from or are
8 otherwise challenged through competitive procurement processes. To illustrate, if
9 a supplier was said to be exercising market power by selling at a \$500/MWH price
10 for one hour in a spot market, clearly that market power is not mitigated if the
11 supplier simply offers to sell at \$500/MWH under a 10-year PPA. In other words,
12 it is not the contract or its term that mitigates market power, it is the fact that the
13 underlying price has been shown to be at competitive levels.
- 14 • The exercise of market power in the electricity business is not confined to the tactic
15 of withholding supply. If APS can simply push competitors aside and impose its
16 high-priced Affiliate PPA on ratepayers, that is another way to exercise market
17 power.
- 18 • Market power is not only about a utility’s sales to other utilities. A utility can
19 exercise market power in its home market. Dr. Hieronymus is wrong to say
20 “whether PWEC might or might not be in a position to exercise market power over
21 sales to APS is frankly irrelevant.”⁹ Far from being irrelevant, it has been set by
22 the Commission as the key issue in Track A of this proceeding.

23
24
25
26

⁹ Id. at page 19 lines 14-15.

1 V. **ADDITIONAL MITIGATION IS REQUIRED TO ADDRESS APS'**
2 **MARKET POWER IN THE TRANSMISSION CONSTRAINED AREA OF**
3 **PHOENIX.**

4 Q. ARE QUANTITATIVE TESTS FOR MARKET POWER LIMITED TO A SINGLE
5 GEOGRAPHIC AREA?

6 A. No. Quantitative tests for market power are often done for sub-markets within a larger
7 market, typically when there are significant transmission constraints into the sub-market.
8 For example, an assessment for New York City alone is often added to a broader
9 assessment of the New York market as a whole. Similarly, in PJM, a separate assessment
10 of the transmission constrained area known as PJM East is often added to an assessment of
11 the entire PJM market.

12 Q. SHOULD ANY SUB-MARKETS BE ASSESSED FOR APS?

13 A. Yes. A separate assessment is required of the APS load served in Phoenix. I will call this
14 the APS Valley Market.

15 Q. WHAT IS THE IN-AREA GENERATION FOR THIS MARKET?

16 A. In-area generation in the APS Valley Market includes only APS capacity, which totals
17 1,393 MW.

18 Q. WHAT IS THE IMPORT TRANSMISSION CAPACITY?

19 A. Import transmission capacity is 3,685 MW into the APS Valley Market. Added to in-area
20 generation capacity this brings total supply to 5,078 MW.

21 Q. WHAT IS PROJECTED LOAD?

22 A. Projected peak load for 2003 in the APS Valley Market is 4,112 MW.

23 Q. WHAT ARE THE RESULTS OF THE SMA?

24 A. The supply margin in the APS Valley Market is only 966 MW. Even if we compare the
25 supply margin to only APS in-area generation, APS fails the SMA because its in-area
26 generation of 1,393 exceeds the supply margin.

APS actually fails the test by a wider margin if, as is appropriate, we allocate some

1 share of the import transmission capacity to APS. Even assigning APS just a pro rata
2 share of transmission capacity, means that another 987 MW should be added to APS
3 capacity.¹⁰ With this alternative allocation, APS fails the SMA more dramatically because
4 its total generation is 2,380 MW, which exceeds the supply margin of just 966 MW.

5 Q. WOULD YOU PLEASE SUMMARIZE THIS SMA?

6 A. Yes. The SMA for the APS Valley market is summarized in Table Three below.

7 **Table Three**

8 **THE SMA FOR THE APS VALLEY MARKET**
9 **(All values in MW)**

| | |
|---------------------|--------------|
| In-Area Capacity | 1,393 |
| Imports | <u>3,685</u> |
| Total Supply | 5,078 |
| Projected Peak load | 4,112 |
| Supply Margin | 966 |
| APS Capacity | 2,380 |
| Pass/Fail SMA | Fail |

14 **Source: Exhibit No. CRR-2**

15 Q. WHAT DOES THIS SMA FOR THE APS VALLEY MARKET MEAN?

16 A. It means that APS has generation market power in the APS Valley Market. The
17 Commission must therefore put mitigation measures in place for the APS Valley Market
18 before allowing a transfer of assets to APS unregulated Affiliate.

19 Q. WHAT KIND OF MITIGATION SHOULD THE COMMISSION PUT IN PLACE?

20 A. I have two sorts of mitigation in mind. The first is to ensure that competitors have full
21 access to the 3,685 MW of import transmission capacity into the APS Valley Market. The
22 second is to ensure competition for APS/PWEC in-area generation through competitive
23 procurement.

24 Q. DOES APS HAVE *TRANSMISSION* MARKET POWER?

26 ¹⁰ Pro rata means in proportion to its share of all generation outside the APS Valley Market, but inside the APS service territory.

1 A. Yes. Obviously, APS is a transmission monopoly. I say "obviously" because: (a) no
2 competitor can build transmission facilities into or within the APS control area; (b) no
3 competitor can import power into or distribute power within APS' control area without
4 APS' consent; (c) APS is regulated by FERC as a transmission monopoly, and (d) APS is
5 not part of an operational RTO, as required by FERC.

6 Q. WHAT MITIGATION DOES FERC REQUIRE FOR APS' TRANSMISSION MARKET
7 POWER?

8 A. FERC has concluded that just having an open access transmission tariff (OATT) is not
9 enough. Rather, transmission providers should participate in an RTO that will adopt the
10 standard market design FERC is now developing. I do not expect an RTO (or any interim
11 independent system operator or administrator) to be in operation before asset transfer, so
12 the Commission will have to order some limited, interim transmission market power
13 mitigation consistent with FERC precedent. The specific mitigation I have in mind is that
14 the Commission must ensure that all generators within APS' control area have the
15 opportunity to be treated comparably to APS' own generation by ensuring that these
16 generators can be studied as and designated Network Resources.

17 **VI. RECOMMENDATIONS TO THE COMMISSION**

18 Q. WHAT ARE YOUR CONCLUSIONS BASED ON YOUR TESTIMONY?

19 A. My primary conclusion is that APS has both transmission and generation market power in
20 both the APS Market as a whole and in the APS Valley Market. APS' generation market
21 power in the market as a whole would continue if the Affiliate PPA were approved,
22 effectively blocking competition from third-party suppliers.

23 Q. WHAT DO YOU RECOMMEND TO THE COMMISSION?

24 A. I recommend that the Commission prohibit the transfer of APS generation assets to its
25 Affiliate unless and until the Affiliate will, in fact, face a competitive challenge on the
26 price and non-price terms at which it will sell back to APS to serve Standard Offer

1 customers.

2 Q. ARE YOU CONCERNED IF THE ASSET TRANSFER IS NOT COMPLETED BY
3 YEAR-END 2002?

4 A. No. The Commission's goal is to do the best it can for consumers and it should take the
5 time needed to achieve that goal. The Commission still could make it clear to financial
6 institutions and to other market participants that the transfer will happen, albeit at a slower
7 pace.

8 Q. WHAT SPECIFIC MITIGATION MEASURES DO YOU RECOMMEND?

9 A. I recommend four specific mitigation measures.

10 Q. WHAT IS YOUR FIRST RECOMMENDED MITIGATION?

11 A. First, competitive procurement must be conducted for any capacity needed to serve
12 Standard Offer customers under a contract with a term of one-year or more. Again,
13 competitive procurement means both requests for proposals (RFPs) and competitive, arms-
14 length, bilateral negotiation. All competitive procurement should be designed and
15 conducted with the goal of getting the best deal for APS' Standard Offer customers in
16 terms of price, risk, and reliability.

17 The details of the competitive procurement will be worked out in Track B of this
18 proceeding, but one crucial element is that the APS Affiliate must bid like any other bidder
19 and be held to its bid if it wins. Competitive negotiation can only be used with non-
20 affiliates. Obviously, APS cannot conduct an arms length negotiation with either PWCC
21 or PWEC.¹¹

22 Q. WHAT PORTION OF THE POWER NEEDS OF STANDARD OFFER CUSTOMERS
23 DO YOU SEE BEING MET THROUGH COMPETITIVE PROCUREMENT?

24 A. I expect APS to competitively procure most of the power it needs for Standard Offer
25 customers. The contract lengths and start dates will vary, but, as a group, these contracts

26 ¹¹ Davis Deposition Transcript at page 22-23. Indeed, I understand that, with the proposed Affiliate PPA, one person approved the PPA for both APS and PWCC.

1 could account for up to 95% of capacity needs. As to contract lengths, I would expect
2 APS, based on risk mitigation principles, to have a portfolio of multi-year (5-, 10-, and 15-
3 year) PPAs.

4 Q. WHAT IS THE SECOND MITIGATION MEASURE YOU RECOMMEND?

5 A. Second, one or more short-term electricity markets must be established for all purchases
6 with a term shorter than one year.

7 Q. WHY MUST THESE SHORT-TERM MARKETS BE ESTABLISHED?

8 A. These short-term markets are another way to achieve consumer benefits. There will be
9 power plants in Arizona and in other Western States that do not sell to APS most of the
10 time. But, for shorter periods of time, these plants may have low-cost capacity and energy
11 to sell. These short-term markets will ensure Arizona ratepayers receive the benefit of that
12 low-cost capacity and energy if and when it is available.

13 Q. WHAT IS THE NATURE OF THE SHORT-TERM MARKET YOU ENVISION?

14 A. The market may range from a real-time market to a day-ahead market to a monthly or
15 seasonal market for capacity and/or energy, or some combination of markets. It is
16 important to realize, though, that this market is in no way, shape or form intended to take
17 the place of long-term procurement, but merely to serve as an additional procurement
18 option to cover short term needs.

19 Q. WHAT PORTION OF STANDARD OFFER NEEDS DO YOU SEE BEING
20 PROCURED IN THESE MARKETS?

21 A. I see these markets accounting for as little as 5% of the power needed to serve Standard
22 Offer customers.

23 Q. DO YOU ANTICIPATE AN RTO WILL ESTABLISH THESE MARKETS?

24 A. Markets established by a FERC-approved RTO likely will satisfy this recommendation,
25 but interim markets established by APS will have to be implemented because an RTO will
26 not be in place before APS wants to complete its asset transfer. However, I do not see a

1 problem with transferring operation of these markets to a FERC-approved RTO once it is
2 established and operating.

3 Q. WILL APS RUN THESE MARKETS ALONE?

4 A. It depends. If APS operates under codes of conduct that ensure its loyalties are to its
5 ratepayers only, it can run these markets alone. If not, a third party should be brought in.

6 Q. WHAT IS THE THIRD MITIGATION MEASURE YOU RECOMMEND?

7 A. Third, there can be no preferential access given to APS (or its Affiliates) generation assets
8 for transmission capacity into or within APS' service territory. To that end, all generation
9 with a signed interconnection agreement, or for whom interconnection studies have been
10 completed and that competes in the APS Market should be designated as a Network
11 Resource by APS. That is, all will be treated equally as suppliers serving APS native load.

12 Q. HOW WILL THIS BE ACHIEVED?

13 A. It will be achieved by the Commission making it a condition of asset transfer. For
14 example, acting on behalf of Standard Offer load, APS will be required to designate as a
15 Network Resource all winners of any competitive procurement.

16 Q. HAS FERC GONE IN THIS DIRECTION?

17 A. Yes. In its well publicized orders involving Entergy, AEP, and Southern, FERC said
18 generators have the right to be studied as a Network Resource when requesting
19 interconnection.¹² More importantly, FERC is codifying such a requirement through its
20 April 24, 2002 Notice of Proposed Rulemaking (NOPR).¹³

21 In the NOPR, there are two types of interconnection service: (a) Energy Resource
22 Interconnection Service and (b) Network Resource Interconnection Service (NRIS). The
23 latter is most relevant here in terms of serving Standard Offer customers. With NRIS,
24 Merchants have the opportunity to be on an equal footing with the incumbent utilities'
25 generation used to serve native load. The NOPR states that with NRIS:

26 ¹² See *AEP Power Marketing, Inc.* 97 FERC ¶ 61,219 (2001).

¹³ Standard Generator Interconnection and Operating Agreement FERC Docket No. RM02-1-000 (2002).

1 The Transmission Provider must conduct the necessary studies
2 and construct the Network Upgrades needed to integrate the
3 Facility (1) in a manner comparable to that in which the
Transmission Provider integrates its generating facilities to
serve native load customers.¹⁴

4 Since APS is buying on behalf of its Standard Offer customers, APS would arrange
5 for transmission service beyond the point of interconnection. Since projects with
6 completed interconnection studies already can deliver their output to the grid, there is no
7 reason why APS should not be required to treat these projects precisely as it would treat
8 one of its own projects; i.e., as a Network Resource comparable to how APS uses its own
9 plants to serve its native load.

10 Q. WHAT IS THE FOURTH MITIGATION MEASURE YOU RECOMMEND?

11 A. Fourth, in the absence of dramatic improvements in transmission, an RFP must be
12 conducted to invite competitive power suppliers to bid from facilities built in the APS
13 Valley Market, in competition with in-area APS capacity. The time frame for bids will be
14 set long enough to allow time for siting in the APS Valley Market. I would expect
15 competitive power suppliers to offer to build new combustion turbine facilities in the APS
16 Valley Market.

17 Q. WHAT IF THERE IS NO RESPONSE TO THE IN-VALLEY RFP?

18 A. If insufficient competition is brought forth by the in-Valley RFP, during periods of
19 congestion, APS should be limited to charging a capacity and energy price not to exceed
20 that expected from competition. Specifically, this price should be set at the cost of a proxy
21 plant based on the capacity, energy, and operating costs of a new combustion turbine. The
22 proxy price can also be used in the interim period between (a) the time APS existing in-
23 area capacity must be used and (b) the date on which the winning bidder will come on line
24 in the Valley Market.

25 Q. YOU MENTIONED CODES OF CONDUCT. DO YOU HAVE ANY SUGGESTIONS
26

¹⁴ Id. at page 12.

1 IN THIS REGARD?

2 A. Yes. I recommend that the Commission require PWEC to be a wholly separate
3 corporation from APS to accommodate the asset transfer in accordance with FERC's
4 proposed Standards of Conduct.¹⁵

5 Q. DOES THIS CONCLUDE YOUR TESTIMONY?

6 A. Yes.

7

8

9 1306045.1/73262.005

10

11

12

13

14

15

16

17

18

19

20

21

22

23

24

25

26

¹⁵ Standards of Conduct for Transmission Provider in Docket No. RM01-10-000 (2001).

**LIST OF TESTIMONY AND OTHER PUBLICATIONS
FOR CRAIG R. ROACH, Ph.D.**

CRAIG R. ROACH

TESTIMONY

- Direct Testimony concerning a proposed Affiliate power purchase agreement and requested waiver from competitive bidding rules, Arizona Corporation Commission Docket No. E-00000A-02-0051, et al. [March 2002] For Panda Gila River, L.P.
- Direct Evidence concerning a proposal for transmission congestion management and expansion cost allocation, Alberta Energy and Utilities Board, Application No. 1248859. [March 2002]. For TransCanada Energy Ltd.
- Direct Evidence concerning competitive procurement and pricing for transmission must run and other ancillary services, Alberta Energy and Utilities Board, Application No. 1244140. [February 2002]. For Ancillary Services Group.
- Comments concerning market power mitigation by RTOs, Federal Energy Regulatory Commission Technical Conference on Standard Electricity Market Design, Docket No. RM01-12-000. [February 2002].
- Direct Testimony concerning prices and other terms and conditions for imbalance energy, Federal Energy Regulatory Commission Docket EL02-46-000. [January 2002]. For Generator Coalition.
- Direct Testimony concerning energy market conditions and energy availability in New Orleans, City Council of New Orleans, Docket No. UD-00-2. [January 2002]. For Thomas Lowenburg, et al.
- Initial Comments concerning the development of market-based mechanisms to evaluate proposals to construct or acquire generating capacity, Louisiana Public Service Commission Docket No. R-26,172. [December 2001]. For Sempra Energy Resources.
- Expert Witness concerning abrogation of power sales agreement, State of Alabama, Circuit Court for Jefferson County, Civil Action Number CV9925070. [2001]. For Southern Company Services.
- Direct Testimony and Supplemental Direct concerning the competitive effects of the proposed merger of Orion Power Holdings, Inc. and Reliant Resources Inc., Federal Energy Regulatory Commission, Docket No. EC02-11-000. [October 2001 and January 2002]. For Applicants.
- Comments and Request For Intervention concerning a proposed refund condition for market-based rates and methods of measuring market power, Federal Energy Regulatory Commission, Docket No. EL01-118-000. [December 2001]. For Boston Pacific Company, Inc.
- Comments concerning the role of market monitoring by RTOs, Federal Energy Regulatory Commission Conference on Electricity Market Design and Structure, Docket No. RM01-12-000. [October 2001].
- Affidavit concerning updated market power analysis in support of Carr Street Generating Station, L.P.'s market-based rate application, Federal Energy Regulatory Commission, Docket No. ER98-4095-001. [October 2001]. For Orion Power Holdings, Inc.

CRAIG R. ROACH

- Expert Report concerning calculation of damages due to a breach of contract, United States District Court (Eastern Texas), Case No. 1:00CV-283. [August 2001]. For EPCO Carbon Dioxide Products, Inc.
- Direct Testimony concerning prudence of Wisconsin Electric Power Company's Power The Future-2 proposal, Public Service Commission of Wisconsin Docket 6630-DR-104. [June 2001]. For Midwest Independent Power Suppliers Coordination Group.
- Direct Evidence Concerning Hydro Quebec's transmission rate application, Régie de L'Énergie in Case R-3401-98. [February 2001]. For Ontario Power Generation, Inc.
- Presentation of guiding principles for monitoring market power in markets run by the California ISO, Federal Energy Regulatory Commission Technical Conference in Docket Nos. EL00-95-00, et al. [January 2001]. For the Electric Power Supply Association.
- Affidavit concerning breach of contract by a utility and the resulting damages through the imposition of a cap on a rate discount known as the LEE Credit, Louisiana Public Service Commission Docket No. U-22801. [August 2000]. For Star Enterprise.
- Direct, Supplemental Direct, Surrebuttal, and Rebuttal Testimony concerning the prudence of passing through the fuel adjustment clause certain electricity purchase costs and the costs of some utility-owned generation, New Orleans City Council Docket No. UD-99-2. [April and December 2000; March and August 2001]. For Reverend C.S. Gordon, Jr., et al.
- Direct and Rebuttal Testimony concerning the pricing of Reliability Must-Run (RMR) Service to the California ISO, Federal Energy Regulatory Commission Docket Nos. ER98-496-006 and ER98-2160-004. [December 1999 and March 2000]. For Duke Energy Power Services.
- Direct, Rebuttal, and Rebuttal to Staff Testimony concerning the prudence of electricity purchase costs passed through the fuel adjustment clause and the underlying, inter-company procurement practices and methods of economic dispatch, Louisiana Public Service Commission Docket No. U-23356. [July and November 1999; July 2000]. For Linda Delaney, et al.
- Affidavit concerning the competitive effects of the proposed merger of Sempra Energy and KN Energy, Inc., Federal Energy Regulatory Commission Docket No. EC99-48-000. [May 1999]. For Questar Pipeline Company.
- Direct and Oral Rebuttal Testimony concerning the competitive effects of the proposed merger of AEP and CSW, Federal Energy Regulatory Commission Docket Nos. EC98-40-000, ER98-2770-000, ER98-2786-000. [April 1999]. For The Dayton Power and Light Company.
- Direct, Supplemental, and Rebuttal Testimony concerning a rate proposal for the Associated Branch Pilots of the Port of New Orleans, Louisiana Public Service Commission. [October 1998]. For the Associated Branch Pilots.
- Direct and Rebuttal Testimony concerning claims for damages by Public Service of Colorado based on alleged improper billings under a power purchase agreement with Tri-State, American Arbitration Association No. 77 Y 181 00230 97. [September and October 1998]. For Tri-State Generation and Transmission Association, Inc.

BOSTON PACIFIC COMPANY, INC.

CRAIG R. ROACH

- Testimony concerning a public records request, 19th Judicial District Court, Parish of East Baton Rouge, State of Louisiana Suit No. 449,691 Div. "A". [August 1998]. For CII Carbon, L.L.C.
- Direct, Cross-Answering, and Surrebuttal Testimony concerning standby rates for self-generators, Louisiana Public Service Commission Docket No. U-20925-SC. [June, July, and August 1998]. For CII Carbon, L.L.C.
- Direct and Surrebuttal Testimony concerning reliability, market power, functional unbundling, divestiture, default supplier, balancing and other restructuring issues, New Jersey Board of
- Public Utilities Docket No. EX94120585Y, et al. [March and April 1998]. For Mid-Atlantic Power Supply Association.
- Declaration concerning antitrust issues made by Florida Power in a motion for summary judgment, United States District Court (Miami, Florida), Case No. 96-594-CIV-LENARD. [February 1998]. For Metropolitan Dade County and Montenay Power.
- Comments concerning market power, market structure, reliability, and related topics in restructuring, Arkansas Public Service Commission Docket Nos. 97-451-U, 97-452-U, and 97-453-U. [February 1998]. For Arkansas Electric Energy Consumers.
- Direct, Rebuttal, and Surrebuttal Testimony concerning a methodology for determining avoided cost prices, Louisiana Public Service Commission Docket No. U-22739. [November, December 1997 and January 1998]. For CII Carbon, L.L.C.
- Direct Testimony concerning Virginia Power's proposals for stranded cost recovery, Virginia State Corporation Commission Case No. PUE 960296. [December 1997]. For Virginia Independent Power Producers, Inc.
- Rebuttal Testimony concerning rules for affiliate transactions in the proposed merger of Pacific Enterprises and Enova Corporation, California Public Utilities Commission No. A.96-10-038. [August 1997]. For Kern River Gas Transmission Company.
- Direct Testimony concerning the proposed merger of Pacific Enterprises and Enova Corporation, California Public Utilities Commission No. A.96-10-038. [August 1997]. For Kern River Gas Transmission Company.
- Rebuttal Testimony concerning the calculation of damages for the Abrogation of Tenaska's power purchase agreement by BPA, American Arbitration Association No. 77-198-0224-95. [July 1997]. For Tenaska, Inc.
- Testimony concerning Ex-Im Bank and OPIC, before the Subcommittee on Tax, Finance, and Exports, Committee on Small Business, U.S. House of Representatives. [May 15, 1997].
- Testimony concerning the abrogation of Tenaska's power purchase agreement by BPA, American Arbitration Association No. 77-198-0224-95. [February 1997]. For Tenaska, Inc.

CRAIG R. ROACH

- Direct Testimony concerning rolled-in rates on Transco, Federal Energy Regulatory Commission Docket Nos. RP95-197-000 and RP95-197-001 (Phase II). [January 24, 1996]. For KCS Energy Marketing, Inc.
- Direct Testimony concerning estimates of avoided costs by Louisiana Power & Light, Louisiana Public Service Commission Docket No. U-21384. [October 13, 1995]. For Calciner Industries, Inc.
- Surrebuttal Testimony concerning estimates of avoided costs by Empire District Electric Company, Missouri Public Service Commission Case No. EC-95-28. [June 20, 1995]. For Ahlstrom Development Corporation.
- Affidavit concerning Duke's market power study, Federal Energy Regulatory Commission Docket No. ER95-760-000. [April 14, 1995]. For North Carolina Municipal Power Agency Number 1 and Piedmont Municipal Power Agency.
- Direct Testimony concerning estimates of avoided costs by Empire District Electric Company, Missouri Public Service Commission Case No. EC-95-28. [January 19, 1995]. For Ahlstrom Development Corporation.
- Direct Testimony concerning a proposal for rolled-in rates by Pacific Gas Transmission, Federal Energy Regulatory Commission Docket No. RP94-149-000. [November 17, 1994]. For Alberta Department of Energy.
- Direct Testimony concerning proposal for market-based rates under Rate-K, Michigan Public Service Commission Case No. U-10625. [October 28, 1994]. For Michigan Cogeneration Coalition.
- Preliminary Written Comments concerning the need for and form of a request for proposals (RFP) by Carolina Power & Light, South Carolina Public Service Commission Docket No. 94-469-E. [August 10, 1994]. For Carolina Competitive Energy Producers.
- Initial and Reply Comments concerning guidelines for evaluation of unsolicited private power proposals, North Carolina Utilities Commission Docket No. E-100, Sub 64. [September/October, 1993]. For Carolina Competitive Energy Producers.
- Direct Testimony concerning Section 712 issues, Florida Public Service Commission Docket No. 921288-EU. [September 10, 1993]. For Florida Competitive Energy Producer's Association.
- Oral Testimony concerning Section 712 issues, Maryland Public Service Commission Case No. 8568. [August 30, 1993]. For Mid-Atlantic Independent Power Producers.
- Direct Testimony concerning Section 712 issues, Georgia Public Service Commission Docket No. 4384-U. [July 16, 1993]. For Electric Generation Association.
- Direct Testimony concerning the proposed merger of Entergy and Gulf States, Federal Energy Regulatory Commission Dockets Nos. EC92-21-000 and ER92-806-000. [March 24, 1993]. For Arkansas Electric Energy Consumers.

BOSTON PACIFIC COMPANY, INC.

CRAIG R. ROACH

Direct Testimony concerning New York curtailment proposals, New York Public Service Commission Case Nos. 92-E-0814 and 88-E-081. [February 25, 1993]. For J. Makowski Associates, Inc.

Direct Testimony concerning Georgia Power Company's Integrated Resource Plan, Georgia Public Service Commission Dockets No. 4131-U and 4134-U. [June 1, 1992]. For Mission Energy Company.

Direct and Rebuttal Testimony concerning Baltimore Gas and Electric's CPCN filing and Cogen Technologies' proposed QF, Maryland Public Service Commission Case No. 8241-Phase II. [August and September 1991]. For Mission Energy Company.

Direct Testimony commenting on Jersey Central Power & Light Company's request for proposals dated August 31, 1990, Docket No. 8010-678B. [December 27, 1990]. For State of New Jersey Department of the Public Advocate [Co-sponsored].

Direct and Rebuttal Testimony concerning the sale/leaseback and restated agreement transaction for Springerville and San Juan power, Federal Energy Regulatory Commission Docket Nos. EL89-17-001 and EL89-18-001. [May and June 1990]. For Century Power Corporation.

Direct and Rebuttal Testimony concerning the proposed merger of Southern California Edison and San Diego Gas and Electric, Federal Energy Regulatory Commission Docket No. EC89-5-000. [November 1989 and January 1990]. For Century Power Corporation.

ARTICLES & SPEECHES

"Measuring Market Power in the U.S. Electricity Business," Energy Law Journal 23, No.1 (2002): 51-62.

"Market Monitoring and Market Power" Presented to The Energy Bar Association, Washington, DC (November 2001).

"Choosing a Market Power Standard for Market-Based Rates" Presented at the Electric Power Supply Association's State Issues & Summer Membership Meeting, Washington, DC (July 2001).

"Energy experts debate capping electricity prices in California," The NewsHour with Jim Lehrer (May 2001).

"Price Caps: An Apparent Short-Term Solution That Creates Long-Term Problems" Presented at Energy and Power Risk Management's Annual Conference, Houston, Texas (May 2001).

"Assuring Restructured Markets are Effectively Competitive" Presented to National Governors' Association, Philadelphia, Pennsylvania (April 2001).

"Who Lost California?" Presented to Gulf Coast Power Association, Houston, Texas (March 2001).

"What Lessons Can New England Learn From California's Wholesale Power Markets" Presented at Northeast Energy and Commerce Association's Annual Meeting, Boston, Massachusetts (December 2000).

"Auction Debate: Last Price v. Pay-as-bid Auction Methods" Moderator and Speaker for the Electric Power Supply Association Regulatory Affairs Committee Meeting (December 2000).

CRAIG R. ROACH

- “Congestion Management: Setting the Stage for Consensus” Moderator and Speaker for the Electric Power Supply Association Regulatory Affairs Committee Meeting (May 2000).
- “Protecting the Consumer by Promoting Competition” Presented at “Trusting Markets-ISO Experiences” a workshop during the Electric Power Supply Association Fall Membership Meeting (October 1999).
- “Renegotiating Power Purchase Agreements When Establishing Competitive Energy Markets” Presented at “Second Generation Issues in the Reform of Public Services” an international conference sponsored by the Inter-American Development Bank (October 1999).
- “Presumptions About Customers That Drive Key Decisions in a Restructured Electricity Business” Presented at the Electric Power Supply Association/Fortune Magazine’s Executive Conference (January 1999).
- “How External Factors Drive the Success of Your Investment and Strategic Decisions” Presented at the Electric Power Supply Association’s Risk Management Conference (December 1998).
- “Assessing Market Power at the Retail Level” Presented at the Electric Power Supply Association’s Summer Membership Meeting (July 1998).
- “The Right Market Power Analysis for Retail Restructuring Proceedings” Presented at the Electric Power Supply Association’s State and Regional Issues Meeting (March 1998).
- “Managing Today’s Significant Risks” Presented at “International Power Project Development and Finance” (February 1998).
- “Managing Today’s Significant Risks” Presented at the Electric Power Supply Association’s Risk Management Conference (December 1997).
- “Modeling Real Markets and Making Real Investment Decisions” Presented at “Market Price Forecasts” (October 1997).
- “Managing Risk in a Restructured U.S. Electricity Business” Presented at the Council of Industrial Boiler Owners’ 19th Annual Meeting (October 1997).
- “A Risk Assessment Checklist for Power Project Acquisitions” Presented at “Mitigation Risk for International Power Projects” (July 1997).
- “A Risk Assessment Checklist for International Power Projects” Presented at “Oil and Gas Companies in Global Power Project Development” (January 1997).
- “A Risk Assessment Checklist for International Power Projects” Presented at “Financing Strategies for International IPP Projects” (November 1996).
- “Addressing Municipalization and Bypass Concerns in a Restructured Electricity Business” Presented at EEI Municipalization and Bypass Conference (October 1996).

CRAIG R. ROACH

- "Performance-Based Ratemaking in an Electricity Business Restructured for Competition" Presented at "Performance-Based Ratemaking for Electric & Gas Utilities" (October 1996).
- "A Risk Assessment Checklist for International Power Projects" Presented at "Neutralizing Risk for International Power Projects" (September 1996).
- "The Right Competitive Strategy For A Restructured U.S. Electricity Business" Presented at "POWER-GEN Americas '95" (December 1995).
- "Practical Lessons Learned from Past Project Failures" Presented at "Risk Mitigation for International Power Projects" (November 1995).
- "The Due Diligence Process: New Views for the Lender and Investor" Presented at "Project Finance Tutorial" (November 1995).
- "State Regulatory Trends" Presented at "Electric Industry Restructuring: Understanding the Implications for the Natural Gas Industry" (October 1995).
- "Summary of State of Competition Opinion Survey" Presented at NARUC Summer 1995 Committee Meeting (July 1995).
- "Spin-Off Services of Retail Competition" Presented at "Giving Customers More Options: The Key to Success in the New Power Market" (May 1995).
- "The Latin American Power Market" Presented at "New Opportunities in the Evolving World Power Market" (November 1994).
- "Transmission Access and Pricing: Evolving Commercial and Regulatory Approaches" Presented at "Competitive Power Congress '94" (June 1994).
- "Section 712: A Surprise Ending" Independent Energy May/June 1994, pp. 55-59.
- "Non-Traditional Competition For Industrial Loads" Presented to Oglethorpe Power (April 1994).
- "Section 712: Southeast Roundup" Presented at "The Southeast Power Market in a New Age of Competition" Southeast Power Report and Independent Power Report (December 1993).
- "The Emerging Latin American Power Market" Presented at "International Power Market" (December 1993).
- "Structural Change in the Electricity Business" Presented at "Annual Fall Policy Roundtable" Council on Alternative Fuels (November 1993).
- "Power Project Siting and Community Relations: Six Elements of a Win-Win Strategy" (Co-authored) Cogeneration & Resource Recovery (July/August 1993).
- "How to Gain A Competitive Advantage in the Electricity Business" Presented at "Bidding For Power" The Institute For International Research (March 1993).

CRAIG R. ROACH

- "The Energy Policy Act of 1992: Its Effect on Market Opportunities in the Short- and Long-Run"
Presented at "Market Opportunities for Utilities in the Energy Policy Act of 1992" Power Engineering and EL&P (February 1993).
- "Natural Gas Versus Coal: Comparisons of Cost, Risk, and Environmental Performance" Institute of Public Utilities (December 1992).
- "How to Gain a Competitive Advantage in the Electricity Business" Presented at "Competitive Bidding for Power Contracts" Infocast (May and October 1991, March 1993).
- "Designing a Bidding System to get the Best Deal for Ratepayers" Presented at "Competitive Bidding for Power Contracts" Infocast (May 1991).
- "Accommodating Renewables in Utility Bidding Systems: Toward a Level Playing Field" Institute of Public Utilities (December 1991).
- "The Successful Independent Power Producer" Presented at "Alternate Energy '90" Council on Alternate Fuels (April 1990).
- "Alternative Approaches to Transmission Access" Institute of Public Utilities (1988).
- "The Coming Boom in Computer Loads" (Coauthored) Public Utilities Fortnightly December 25, 1986, pp. 30-34.

BOOKS

- "Policy Models and Policymakers: The Case of Industrial Energy Use." In Coal Models and Their Use in Government Planning, pp. 23-36. Edited by James Quirk, Katsuaki Terasawa, and David Whipple. New York: Praeger Publishers, 1982.
- "Coal Substitution." In Energy-Policy Analysis and Congressional Action, pp. 97-113. Edited by Raymond C. Scheppach and Everett M. Ehrlich. Lexington, MA: D.C. Heath and Company, 1982.

CONSULTING REPORTS (PUBLIC ONLY)

- Still Waters Run Deep. For the Electric Power Supply Association. Washington, D.C. [2002].
- Assessing the "Good Old Days" of Cost-Plus Regulation. For the Electric Power Supply Association. Washington, DC, [2001].
- An Initial Analysis of Recent Wholesale Prices, Price Caps and Their Effect on Competitive Bulk Power Markets. For the Electric Power Supply Association. Washington, DC, [2000].
- RTOs Must Manage Transmission, Not Power Markets. Facilitated by Boston Pacific for the Electric Power Supply Association. Washington, DC, [2000].
- Competing For Global Power Projects: A White Paper on the Role of the Export-Import Bank of the United States and the Overseas Private Investment Corporation in the Global Electric Power Business. For the International Energy Development Council. Washington, DC, [1997].

CRAIG R. ROACH

Stating Their Differences: A Report on State Legislators' Views Concerning Electric Industry Restructuring. Washington, DC: Electric Generation Association, [1996].

The State of Competition: A Survey of State Commissions on Competition in the Electricity Business. Washington, DC: Electric Generation Association, [1995].

What Contribution Can Environmental Valuation Make to the Cost Competitiveness of Renewables in Current Bidding Systems for the Electricity Business? A Sourcebook for State Regulatory Commissions. For the Global Change Division, U.S. Environmental Protection Agency, [June 1991].

Electric Resources and Environmental Impacts. For the California Legislature's Joint Committee on Energy Regulation and the Environment. Sacramento, CA, [1990].

An Analysis of the Transmission Access and Pricing Policies of State Governments. Washington, DC: Boston Pacific Company, Inc., [1989].

Office Productivity Tools for the Information Economy: Possible Effects on Electricity Consumption. Palo Alto, CA: Electric Power Research Institute, [October 1988].

Competitive Procurement of Generating Capacity: Summary of Procedures in Selected States. For Office of Technology Assessment, U.S. Congress. Washington, DC: Boston Pacific Company, Inc., [1988].

Competitive Bidding in the Electricity Business: An Analysis of State Bidding Programs for QFs. Washington, DC: Boston Pacific Company, Inc., [1987].

Key Demographic Events for a Long-Term Forecast of Economic and Market Conditions. Palo Alto, CA: Electric Power Research Institute, [Working Paper 1985].

Transition to an Information Economy: Implications for the Electric Utility Industry. Palo Alto, CA: Electric Power Research Institute, [Working Paper 1984].

Coal Use by Industry: Forecasts and Analysis. Washington, DC: ICF Incorporated, [1982].

Prospects for Synthetic Fuels: Selected Topics. Washington, DC: ICF Incorporated, [1981].

A Policy Paper on the Environmental Consequences of the Emerging Synfuels Industry. Washington, DC: ICF Incorporated, [1980].

Methanol from Coal: Prospects and Performance as a Fuel and as a Feedstock. Washington, DC: ICF Incorporated, [1980].

A Report to the President's Commission on Coal: Possible Findings and Policy Recommendations for Hastening the Substitution of Coal for Imported Oil. Washington, DC: ICF Incorporated, [1979].

CRAIG R. ROACH

CONGRESSIONAL REPORTS

A Strategy for Oil Proliferation: Expediting Petroleum Exploration and Production in Non-OPEC Developing Countries. Washington, DC: The Congressional Budget Office, [1979].

Replacing Oil and Natural Gas with Coal: Prospects in the Manufacturing Industries. Washington, DC: The Congressional Budget Office, [1978].

President Carter's Energy Proposals: A Perspective (coauthored). Washington DC: The Congressional Budget Office, [1977].

Financing Waterway Development: The User Charge Debate. Washington, DC: The Congressional Budget Office, [1977].

Alton Locks and Dam: A Review of the Evidence. Washington, DC: The Congressional Budget Office, [1976].

DISSERTATION

Coal Use by Industry and the Associated Air Pollution Emissions in the Period From 1980 to 2000 Under Alternative Market and Regulatory Conditions. Madison, WI: University of Wisconsin.

Exhibit No.__(CRR-2)

SMA SUPPORT DOCUMENTATION

SMA Support Documents - APS Generation

Current Plants in APS Area

| Plant, Location | Type | Summer Capacity | APS Capacity | Other Capacity |
|-------------------------------|------|-----------------|--------------|----------------|
| Childs 1, Camp Verde AZ | HY | 1 | 1 | - |
| Childs 2, Camp Verde AZ | HY | 1 | 1 | - |
| Childs 3, Camp Verde AZ | HY | 1 | 1 | - |
| Cholla 1, Joseph City AZ | ST | 110 | 110 | - |
| Cholla 2, Joseph City AZ | ST | 245 | 245 | - |
| Cholla 3, Joseph City AZ | ST | 260 | 260 | - |
| Cholla 4, Joseph City AZ | ST | 380 | 0 | 380 |
| Douglas GT1, Douglas AZ | GT | 16 | 16 | - |
| Four Corners 1, Farmington NM | ST | 170 | 170 | - |
| Four Corners 2, Farmington NM | ST | 170 | 170 | - |
| Four Corners 3, Farmington NM | ST | 220 | 220 | - |
| Four Corners 4, Farmington NM | ST | 740 | 111 | 629 |
| Four Corners 5, Farmington NM | ST | 740 | 111 | 629 |
| Irving 1, Camp Verde AZ | HY | 1 | 1 | - |
| Ocotillo 1, Tempe AZ | ST | 111 | 111 | - |
| Ocotillo 2, Tempe AZ | ST | 111 | 111 | - |
| Ocotillo GT1, Tempe AZ | GT | 54 | 54 | - |
| Ocotillo GT2, Tempe AZ | GT | 49 | 49 | - |
| Palo Verde 1, Wintersburg AZ | NP | 1,243 | 361.96 | 881 |
| Palo Verde 2, Wintersburg AZ | NP | 1,243 | 361.96 | 881 |
| Palo Verde 3, Wintersburg AZ | NP | 1,247 | 363.13 | 884 |
| Saguaro 1, Red Rock AZ | ST | 100 | 100 | - |
| Saguaro 2, Red Rock AZ | ST | 99 | 99 | - |
| Saguaro GT1, Red Rock AZ | GT | 47 | 47 | - |
| Saguaro GT2, Red Rock AZ | GT | 47 | 47 | - |
| Solar (9), Arizona | PV | 1 | 1 | - |
| Valencia 1, Nogales AZ | IC | 1 | 0 | 1 |
| Valencia 2, Nogales AZ | IC | 1 | 0 | 1 |
| Valencia 3, Nogales AZ | IC | 1 | 0 | 1 |
| Valencia 4, Nogales AZ | IC | 1 | 0 | 1 |
| Valencia GT1, Nogales AZ | GT | 14 | 0 | 14 |
| Valencia GT2, Nogales AZ | GT | 14 | 0 | 14 |
| Valencia GT3, Nogales AZ | GT | 14 | 0 | 14 |
| West Phoenix 4, Phoenix AZ | ST | 33 | 33 | - |
| West Phoenix 5, Phoenix AZ | ST | 12 | 12 | - |
| West Phoenix 6, Phoenix AZ | ST | 63 | 63 | - |
| West Phoenix CC1, Phoenix AZ | CS | 80 | 80 | - |
| West Phoenix CC2, Phoenix AZ | CS | 80 | 80 | - |
| West Phoenix CC3, Phoenix AZ | CS | 80 | 80 | - |
| West Phoenix GT1, Phoenix AZ | GT | 50 | 50 | - |
| West Phoenix GT2, Phoenix AZ | GT | 50 | 50 | - |
| Yucca GT1, Yuma AZ | GT | 18 | 18 | - |
| Yucca GT2, Yuma AZ | GT | 18 | 18 | - |
| Yucca GT3, Yuma AZ | GT | 52 | 52 | - |
| Yucca GT4, Yuma AZ | GT | 51 | 51 | - |
| Yuma Axis 1, Yuma AZ | ST | 75 | 0 | 75 |

APS Out-of-Area Generation

| | | | | |
|-------------------|----|-----|-----|-----|
| Navajo 1, Page AZ | ST | 750 | 105 | 645 |
| Navajo 2, Page AZ | ST | 750 | 105 | 645 |
| Navajo 3, Page AZ | ST | 750 | 105 | 645 |

| | | | |
|----------------------------------|-------|-------|-------|
| Total Capacity (In area) | 8,115 | 3,710 | 4,405 |
| Total APS Capacity (Out-of-area) | 315 | | |

| | |
|------------------------------|-------|
| Total APS Capacity | 4,025 |
| Total Other In-Area Capacity | 4,405 |

Source Western Systems Coordinating Council Summary of Estimated Loads and Resources
Existing Generation & Significant Additions and Changes to System Facilities 2000-2010
Dated May 2001, Data as of January 1, 2001
West Phoenix 4-6 Listed as mothballed, but returned to service in 2001

SMA Support Documents - Generation Additions

Merchants in APS Service Area by 2003

| Plant Name | Location | MW |
|----------------------|----------------------|-------|
| Desert Basin | Casa Grande, AZ | 520 |
| West Phoenix | Phoenix, AZ | 620 |
| Arlington Valley 1-2 | Arlington Valley, AZ | 1,180 |
| Gila River 1-4 | Gila Bend, AZ | 2,080 |
| Redhawk 1-2 | Palo Verde, AZ | 1,060 |
| Sundance | Coolidge, AZ | 450 |
| Harquahala | Harquahala, AZ | 1,040 |
| Mesquite | Arlington, AZ | 1,250 |

| | |
|-------------|-------|
| Total MW | 8,200 |
| APS Owned | 1,680 |
| Other Owned | 6,520 |

Source: Testimony of Jerry Smith in Docket E-01345A-01-0822, March 29, 2002
Plants out of APS service area were removed

SMA Support Documents - Imports and Loads**Imports into Phoenix from other APS Units**

| | |
|--|------------|
| Total In-Area Capacity for APS Territory | 16,315 |
| less West Phoenix | 448 |
| less Ocotillo | 325 |
| less West Phoenix Additions | <u>620</u> |

| | |
|---|--------|
| Total In-Area Capacity for APS Territory Outside of Phoenix | 14,922 |
|---|--------|

| | |
|----------------------------------|--------------|
| Total APS Owned In-Area Capacity | 5,390 |
| less APS Capacity in Phoenix | <u>1,393</u> |

| | |
|---|-------|
| APS In-Area Capacity Outside of Phoenix | 3,997 |
|---|-------|

| | |
|---|-----|
| APS In-Area Market Share Outside of Phoenix | 27% |
|---|-----|

| | |
|----------------------------|-------|
| TTC into APS Phoenix Area* | 3,685 |
|----------------------------|-------|

| | |
|--|-----|
| APS Share of TTC into APS Phoenix Area | 987 |
|--|-----|

Peak Load in 2003

| | |
|----------------------------|-------|
| APS System-Wide Peak Load* | 5,911 |
| APS Phoenix Peak Load* | 4,112 |

* Rebuttal Testimony of Cary Deise, Docket E-01345A-01-0822, et al.